

**WHAT IS CLAIMED IS:**

1. A specimen holder (1) for water-containing specimens for high-pressure freezing, the specimen holder (1) comprising at least two shaped parts (2, 3; 2, 4) detachably joinable to one another, and the joined shaped parts (2, 3; 2, 4) forming a receptacle (6) for the specimen, wherein at least one of the shaped parts (2; 3) comprises a diamond.
2. The specimen holder (1) as defined in Claim 1, wherein at least one of the shaped parts (2; 3) is of disk-shaped configuration.
3. The specimen holder (1) as defined in Claim 1 or 2, wherein a spacer ring (9) fabricated from metal is provided between the shaped parts (2; 3).
4. The specimen holder (1) as defined in Claim 3, wherein both shaped parts (2; 3) are configured as disk-shaped diamonds.
5. The specimen holder (1) as defined in Claim 1 or 2, wherein the other shaped part (3) [is] fabricated from metal, [is] of disk-shaped configuration, and comprises a shaped-on bead (8) running around the rim.
6. The specimen holder (1) as defined in Claim 1, wherein the diamond comprises an orifice (10) for the delivery of high pressure.
7. The specimen holder (1) as defined in Claim 3 or 5, wherein gold or aluminum or copper is used the metal.
8. The specimen holder (1) as defined in Claim 1, wherein both shaped parts (2; 3) are of planar configuration on their inwardly directed surfaces, and a

spacer (9) running around the surfaces is arranged between those surfaces as a seal and in order to constitute the specimen receptacle (6).

9. The specimen holder (1) as defined in at least one of the foregoing claims, wherein the diamond is configured as polycrystalline CVD diamond.
10. The specimen holder (1) as defined in at least one of the foregoing claims, wherein at least one of the shaped parts (2, 3, 4) is configured with an irregularly shaped surface.